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AMSAT NEWS SERVICE
ANS-219

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to: ans-editor [at] amsat.org.

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see: https://mailman.amsat.org/postorius/lists/ans.amsat.org/

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ANS-219 AMSAT News Service Weekly Bulletins

To: All RADIO AMATEURS
From: Radio Amateur Satellite Corporation
712 H Street NE, Suite 1653
Washington, DC 20002

DATE 2022 Aug 07

40th AMSAT Space Symposium and Annual General Meeting - Bloomington, MN - Oct. 21-22, 2022

Highlights of all scheduled events include:

- AMSAT Board of Directors Meeting, October 20-21
- 40th AMSAT Space Symposium and Annual General Meeting, October 21-22
- Friday Night Social and Auction, October 21
- AMSAT Banquet and Reception, October 22
- AMSAT Ambassador Breakfast, October 23

A preliminary schedule is available on the AMSAT Member Portal, launch.amsat.org, under the Events tab.

Crowne Plaza is located adjacent to the Minneapolis / St. Paul International Airport and provides complimentary, scheduled shuttle to and from the airport. Nearby attractions include Mall of America with Nickelodeon Universe Theme park, Target Field, and the Minnesota Zoo.

You can make hotel reservations by calling the hotel directly at (952) 854-9000. The group code is ASG (Amateur Satellite Group). Hotel reservations can also be made online at the following link: https://tinyurl.com/ANS-219-Symposium-Rooms.

Symposium tickets and banquet reservations may be purchased on the AMSAT Member Portal. Log into https://launch.amsat.org/ and clock on the Events tab.

We at AMSAT, are excited to be able to host an in-person Symposium this year. We hope that you can join us in celebrating Amateur Radio in Space.

[ANS thanks AMSAT for the above information.]

Apogee View

This year’s Hamvention theme was Reunion, which was certainly evident among this year's attendees. After a two-year absence due to COVID restrictions, it was great to see everyone face-to-face and talk about the exciting opportunities of amateur radio in space. Like many of our visitors, I was excited and impressed with the progress and accomplishments in our Engineering, CubeSat Simulator, and Youth Initiative programs.

The AMSAT TAPR Banquet on Friday night was an excellent opportunity to come together with our friends at Tucson Amateur Packet Radio (TAPR) and pay tribute to Bob Bruninga, WB4APR (SK), who we lost earlier this year. I want to thank everyone who shared their stories of Bob, who has contributed so much to amateur radio and amateur radio in space.

Attendance at the AMSAT Forum was fantastic. Jerry Buxton, N0JY, and Jonathan Brandenburg, KF5IDY, provided an excellent Engineering update on GOLF, our in-house developed reaction wheels, and the new Fox Plus program. Frank Karnauskas, N1UW, brought us up to speed on the AMSAT Youth Initiative program, which takes an innovative and inspiring approach to introduce youth to amateur radio in space. Last but not least, Alan Johnston, KU2Y, and his students demonstrated the CubeSat Simulator and CubeSatSim Lite, which have made a terrific impact on the STEM education community.

I thank the volunteers who donated their time over the long weekend to serve as AMSAT Ambassadors at our booths. Our volunteers, led by Phil Smith, W1EME, did a phenomenal job in answering questions, helping our members, and making AMSAT’s presence at Hamvention 2022 a huge success. THANK YOU!

40th Anniversary of the Space Camp
For those not aware, the U.S. Space and Rocket Center in Huntsville, Alabama, celebrated the 40th Anniversary of Space Camp on June 18, 2022. AMSAT Ambassador Tim Cunningham, N8DEU, hosted special event station K4S, demonstrating his field day amateur radio satellite station and answering questions about amateur radio in space. While Tim worked the International Space Station (ISS) several times, along with multiple contacts through other LEO satellites, the highlight of his efforts was facilitating a contact between a graduating Space Camp young lady and an astronaut aboard the ISS. Congratulations, Tim, on a job well done!

An Innovation Road Map
Innovation and experimentation are the cornerstones of what sets AMSAT apart in the amateur satellite community and what we need to continue to focus on in AMSAT’s future.

In June 2021, AMSAT implemented a strategic plan defining who we are and where we want to go. In this plan, we affirmed our commitment to return to higher orbits and the vital role GOLF plays in helping us to develop the necessary systems and skills to take us there. In addition, we expressed our continued support in providing easily accessible amateur radio satellites in low earth orbit, encouraging the next generation of engineers, software developers, scientists, and mathematicians through STEM educational initiatives, and partnering with ARISS on human spaceflight programs. It is now time that we put that plan into action.

Compliance and Open Projects – Establish export control policy and open project framework to allow AMSAT’s return to international collaboration. AMSAT is committed to complying with U.S. export controls laws and regulations, including the International Traffic in Arms Regulations (ITAR), the Export Administration Regulations (EAR), and the Office of Foreign Assets Control (OFAC) regulations. ITAR and EAR regulations govern the shipment, transfer, and access of export-controlled data, items,

equipment, materials, and software to non-U.S. persons or entities (domestically and abroad). OFAC regulations impose sanctions and embargoes on transactions or exchanges with designated countries, entities, and individuals.

To ensure compliance with all Export laws, AMSAT must establish an Export Control policy, including procedures for complying with Export Control laws and educating all individuals working at, with, or on behalf of AMSAT, who work with, or have access to export-controlled technical data software, materials, and equipment, on such laws, policies, and procedures. This policy should require actively managing and monitoring compliance with Export Control laws and authorizing the creation of procedures to administer major organizational functions related to export compliance.

AMSAT also recognizes that a critical component of its mission is supporting fundamental research, developing relationships and participating in the worldwide scientific, amateur radio, and amateur satellite communities to further the pursuit of knowledge.

Export control laws restrict foreign national access to items or information that might be contrary to U.S. interests; however, these laws include exemptions for information published or disseminated in the Public Domain. AMSAT must take advantage of these carve- outs, when available, to further its international collaboration and outreach efforts.

As such, we are working on implementing the necessary online project management and collaboration tools to support our open projects and the required publication processes to share what we have learned with the world.

Experimentation and Education – Develop open and sustainable CubeSat programs to provide technological experimentation and educational support in Low Earth Orbits (LEO).

Low earth orbiting (LEO) satellites play a critical role in AMSAT’s future. LEO FM CubeSats provide a cheap entry point to amateur radio in space. The lower costs associated with building and launching them make them an excellent platform to support our technological experimentation and STEM education initiatives. AMSAT’s Fox Plus program will be the foundation for our future efforts in LEO.

In addition, proposed orbital debris mitigation standards will require all flight systems intended to be flown above low earth orbits to be “proven” in low earth orbit first. AMSAT’s GOLF-TEE (Greater Orbit Larger Footprint - Technology Exploration Experiment) was developed to demonstrate the necessary technologies for higher orbits.

Scientific Research – Develop an open CubeSat program to enable scientific research related to amateur radio above low earth orbits. As space becomes increasingly crowded, obtaining a license to launch a satellite above low earth orbit will require a reason more important than amateur radio. Moving forward, we need to incorporate missions that include benefits for the greater good of society, of which scientific research and education appear to be our easiest path.

AMSAT is not a scientific research institution, but we can certainly benefit by partnering with educational institutions to study the long-term effects of radiation exposure on communication and command and control systems. For example, our partnership with Vanderbilt University during the Fox Program provides a template as we chart our return to HEO.

GEO Rideshare – Develop a program to secure an amateur radio payload in geostationary orbit above North America. I am often asked, “When will AMSAT put a satellite in geostationary orbit?” The short answer is NEVER,... if we have to do it ourselves. The Federal Communications Commission (FCC) is not going to allow a bunch of weekend warriors to play in geostationary orbit; not to mention, the price of admission, continued operation, and indemnification is beyond our reach. So, our best opportunity is to partner with someone already going there as a secondary payload.

No one has knocked on our door offering a free ride, nor have we succeeded in our numerous cold call attempts. We need someone on the inside or even a friend of a friend, who can get us in the room. If you know someone and an opportunity, I could use your help. Until next time, thank you for supporting AMSAT. Onward & Upward!

[ANS thanks Robert Bankston, KE4AL, AMSAT President for the above information.]

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To commemorate the 50th anniversary of its launch on
October 15, 1972, this year's coin features
an image of AMSAT-OSCAR 6.
Join the AMSAT President's Club today and help
Keep Amateur Radio in Space!
https://www.amsat.org/join-the-amsat-presidents-club/
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including PCs, laptops, Raspberry PIs, and Android devices running under a Termux environment. A new limited capability version that operates under a 32-bit DOS environment has been released as well.

PREDICT version 2.3.0 introduces an easy-to-use satellite transponder database editor and support for a mouse (or touch screen under a Termux/Android environment). New features make it possible to run PREDICT in Multi-Satellite Tracking Mode, left click on any satellite displayed on the screen, and be brought directly into Single Satellite Tracking Mode for more detailed tracking information on the chosen satellite. In addition, previously separate "Vocalizer" code has been integrated into PREDICT's mainline source. Text-to-speech operations are now executed in separate threads rather than forked background processes as was the practice in the past.

PREDICT was originally released under an Open Source Software General Public License in late 1999, and is cataloged under the Smithsonian/NASA Astrophysics Data System hosted by Harvard University. PREDICT has been successfully employed by the National Aeronautics and Space Administration where it provides orbital prediction and tracking data for VLBI radio telescope steering. PREDICT is employed by the European Space Agency's Rutherford Appleton Laboratory where it provides tracking and velocity profile data used to steer the 25 meter dish antenna at the Chilbolton Observatory (https://www.esa.int/ESA_Multimedia/Images/2006/03/Chilbolton_Observatory). PREDICT also powers AMSAT North America's on-line satellite prediction service (https://www.amsat.org/track/), and has served as the basis for a host of other derivative open-source software applications. Additional information, including screenshots and download links, are available via the PREDICT website at https://www.qsl.net/kd2bd/predict.html

[ANS thanks John Magliacane, KD2BD, for the above information.]

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and forward system, a camera and a radiation sensor. The downlink is on the IARU coordinated frequency 437.400 MHz with 1200 bps FSK telemetry and camera pictures with AFSK SSTV and LoRa.

Developed and built by 750 girl students from across India, the satellite is the result of ISRO pushing for girls to take up Science, Technology, Engineering, and Mathematics (STEM). The eight-kilogram CubeSat carries 75 different payloads, each weighing around 50 grams, that will conduct femto-experiments and has a mission life of six months. It is part of the Azadi Ka Amrit Mahotsav celebrations, to mark the 75th anniversary of India's Independence.

Read the complete story at https://tinyurl.com/ANS-219-AzaadiSAT.

[ANS thanks Nico Janssen, PA0DLO, and IndiaToday.in for the above information.]

Astro Pi Mission Space Lab 2021/22: The Results

RaspberryPi.org reports, "It’s been an incredible year for the European Astro Pi Challenge. We’ve sent new hardware into space, seen record numbers of young people participate in the Challenge, and received lots of fantastic programs. Before we say goodbye to the 2021/22 European Astro Pi Challenge, the Raspberry Pi Foundation and the European Space Agency are thrilled to announce this year’s winning and highly commended Mission Space Lab teams.

"In Mission Space Lab, teams of young people aged up to 19 work together to create scientific experiments to be carried out on the International Space Station. Their mission is to design and create a program to run on the two Astro Pi computers – space-adapted Raspberry Pi's with cameras and a range of sensors.

"This year, 799 teams of young people designed experiments and entered Mission Space Lab and 502 of these teams were invited to Phase 2, which is 25% more than last year! The teams each received an Astro Pi kit to write and test their programs on and 299 teams submitted programs that passed rigorous testing at Astro Pi Mission Control and achieved ‘flight status’.

"After their program collected data during the experiment’s three-hour runtime on the ISS, each team analyzed the results and wrote a short report to describe their experiment.

"We were especially excited to see what experiments young people would investigate this year, as their programs would be the first to run on the brand-new Astro Pi units, which were named after Nikola Tesla and Marie Curie by participants in this year’s Mission Zero."

For a look at the teams’ investigations for Mission Space Lab 2021/22 go to https://tinyurl.com/ANS-219-Astro-Pi.

[ANS thanks the Raspberry Pi Foundation for the above information.]

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RS6S NORAD Cat ID 53311
RS9S NORAD Cat ID 53312
RS12S NORAD Cat ID 53313

Thanks to Nico Janssen, PA0DLO, for the identification of these satellites.

[ANS thanks Ray Hoad, WA5QGD, AMSAT Orbital Elements Manager, for the above information.]

ARISS NEWS

Amateurs and others around the world may listen in on contacts between amateurs operating in schools and allowing students to interact with astronauts and cosmonauts aboard the International Space Station. The downlink frequency on which to listen is 145.800 MHz worldwide.

+ Upcoming Contacts

Ufa State Aviation Technical University, Ufa, Russia, direct via TBD.
The ISS callsign is presently scheduled to be RS0ISS.
The downlink frequency is presently scheduled to be 145.800 MHz.
The scheduled crewmember is Oleg Artemiev.
Contact is go for 2022-08-10 10:05 UTC.

Kopernik Observatory & Science Center (KOSC), Vestal, N.Y., direct via K2ZRO.
The ISS callsign is presently scheduled to be NA1SS.
The downlink frequency is presently scheduled to be 145.800 MHz.
The scheduled crewmember is Bob Hines KI5RQT.
Contact is go for: Wed 2022-08-10 16:11:14 UTC.

Summer Space School at IKI RAN (Space Research Institute of the Russian Academy of Sciences), Moscow, Russia, direct via TBD.
The ISS callsign is presently scheduled to be RS0ISS.
The downlink frequency is presently scheduled to be 145.800 MHz.
The scheduled crewmember is Sergey Korsakov.
Contact is go for: Mon 2022-08-08 11:40 UTC.

+ Successful Contacts

About Gagarin From Space Conducting a session of amateur radio communication with students in Almetyevsk, Almetyevsk, Tatarstan, Russia, direct via RC4P.
The ISS callsign was RS0ISS.
The crewmember was Sergei Korsakov.
Contact was successful: 2022-07-30 14:08 UTC.

Swiss Guide and Scout Movement, Bern, Switzerland, direct via HB9JAM.
The ISS callsign was OR4ISS.
The crewmember was Samantha Cristoforetti, IZ0UDF.
Contact was successful: Wed 2022-08-03 12:23:28 UTC.

The latest information on the operation mode can be found at https://www.ariss.org/current-status-of-iss-stations.html

The latest list of frequencies in use can be found at https://www.ariss.org/contact-the-iss.html

[ANS thanks Charlie Sufana, AJ9N, one of the ARISS operation team mentors for the above information.]

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+ NASA astronaut Kjell Lindgren KO5MOS, who is on the International Space Station, describes his amateur radio contact with 8-year-old Isabella from Kent, UK, as his favorite so far. He tweeted: "I've had a lot of fun using the #ARISS amateur radio station #NA1SS on the @Space_Station to talk with ham radio operators all over the world. I've even (unofficially) worked stations on all continents! But this may be my favorite contact so far." A recording of the contact is at https://tinyurl.com/ANS-219-Favorite.
[ANS thanks AMSAT-UK for the above information.]

+ On August 9, 2022 the Iranian remote sensing satellite Khayyam is to be launched from Baykonur on a Soyuz 2.1B & Fregat, along with 16 Russian cubesats. One of those will be the 3U cubesat KAI 1, aka KNITU-KAI, NILAKT DOSAAF LLC, ANO DPO "KIRO". Its callsign will be RS26S. It carries a 145/435 MHz repeater, panoramic cameras and a temperature meter based on a fiber Bragg grating. Currently no further details are available. Also it is not clear if any of the other cubesats will appear on any amateur radio frequencies.
[ANS thanks Nico Janssen, PA0DLO for the above information.]

+ The White House released a new National Orbital Debris Implementation Plan on July 29. The plan focuses on 44 specific actions which need to be taken, or researched, or collaborated on, around debris mitigation, tracking, and remediation, and delegates various government agencies to undertake them. To read the entire document, see https://bit.ly/3JtYpxR [ANS thanks The Orbital Index for the above information.]

Join AMSAT today at https://launch.amsat.org/

In addition to regular membership, AMSAT offers membership to:

* Societies (a recognized group, clubs or organization).
* Primary and secondary school students are eligible for membership at one-half the standard yearly rate.
* Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status.
* Memberships are available for annual and lifetime terms.

Contact info [at] amsat.org for additional membership information.

73 and remember to help Keep Amateur Radio in Space!

This week's ANS Editor, Frank Karnauskas, N1UW
n1uw at amsat dot org